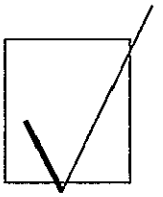
CHECKLIST 

For Improving Electric Power Utility Efficiency

Compiled by the Central Project Team of the
Electric Power Utility Efficiency Improvement Study

Christoph Menke, Manager
P. Gregory Fazzari, Consultant

Checklist

For Improving Electric Power Utility Efficiency

Reprint of annex to *Improving Electric Power Utility Efficiency: Issues and Recommendations*
(World Bank Technical Paper, Energy Series)

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November 1993

For additional copies of this checklist, write to
World Bank Industry and Energy Department
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Annex to
Improving Electric Power Utility Efficiency:
Issues and Recommendations

Checklist for Improving Electric Power Utility Efficiency

Contents

This annex to *Improving Electric Power Utility Efficiency: Issues and Recommendations* (World Bank Technical Paper, Energy Series) is provided separately for field use.

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Foreword

This checklist is one of the products of an effort sponsored by the World Bank and nine other international aid agencies to analyze the poor operational and financial efficiency of power plants in developing countries and to recommend corrective actions. In 1988-89, the sponsors began a study that focused on diesel power plants, which are generally comparable worldwide. The project team visited 25 diesel utilities in developing countries and evaluated data from nearly 200 others, and presented their detailed findings in the "Core Report of the Electric Power Utility Efficiency Improvement Study" (Industry and Energy Department Working Papers, Energy Series Paper No. 46, September 1991). The study's central project team has now compiled a briefer and more accessible volume distilling some lessons of experience, *Improving Electric Power Utility Efficiency: Issues and Recommendations.* This volume has been published as a World Bank Technical Paper, Energy Series, and is available directly from the World Bank's Publications Department, 1818 H Street, N.W., Washington, D.C., USA.

For on-site monitoring of utilities' performance, the team has developed the "Checklist for Improving Electric Power Utility Efficiency." The checklist is included as an annex in the technical paper but is made available here separately for field use. For additional copies of the checklist alone, write to the World Bank Industry and Energy Department Joint Energy File Room, G5-100, 1818 H Street, N.W., Washington, D.C., USA. As the team indicates, the recommendations address basic conditions of viability and efficiency and should be seen to supplement rather than supersede the operational directives and appraisal rules of individual organizations.

The checklist was prepared by Christoph Menke and Gregory Fazzari, who worked for the project under funding from GTZ.

Gunter Schramm

Project Manager,
Electric Power Utility Efficiency Study

Checklist for Improving Electric Power Utility Efficiency

Policy guidelines for improving the efficiency of electric power utilities prepared by the Steering Committee of the Electric Power Utility Efficiency Improvement Study (EPUES)

Instructions for use of the checklist

The checklist summarizes some of the most crucial factors that could be used to rate the past performance of a utility. These factors fall into two categories:

- Qualitative factors to which no numerical values can be assigned
- Quantitative factors that are measured on a numerical scale and for which a target value can be given.

For qualitative factors, performance can be rated on an ordinal scale of five categories ranging from "good" to "bad" (respectively from "yes" via "partly" to "no" in the case of dichotomous criteria). For quantitative factors, the performance can be rated on this same scale and in some cases in comparison to the target values provided.

Thus, the overall performance can be conveniently visualized. Although this approach does not provide an unambiguous rating of the utility's performance, it conveys a general overview of the areas where the utility fares well and where it may require improvements.

The factors to be assessed in this checklist are those that refer to the electricity business. When utilities handle other businesses as well, such as gas, water, or telephones, care must be taken to segregate the electrical business from the others.

Note:
The numerical target values given are designed to be applicable universally. They do not present "best practice" values but rather minimum acceptable conditions that should only be relaxed under very special circumstances.

Checklist

Level of autonomy	*Performance rating scale*				
	Good (Yes)	<<<<	*Medium* (Partly)	>>>>	*Bad* (No)
Qualitative indicators					
1. Does the utility have clear and consistent objectives?					
a. Are the long-term corporate objectives clearly established?					
b. Are they likely to ensure adequate operational and financial performance?					
c. Has management sufficient autonomy to operate the utility according to corporate objectives?					
2. Are daily operations of the utility insulated from external political pressure?					
3. Has management the right to hire and fire employees and to negotiate conditions of employment?					
4. Does the utility control its employees' salaries?					
5. Has the utility the right to adjust tariffs according to costs to produce sufficient revenues?					
6. Does the utility have timely access to sufficient foreign exchange?					

Top management	Performance rating scale				
	Good (Yes)	<<<<	Medium (Partly)	>>>>	Bad (No)
Qualitative indicators					
1. Is there a department in charge of corporate planning?					
2. Are there appropriate and consistent annual operating objectives?					
3. Is there an appropriate management information and reporting system?					
4. Is there a system of appropriate performance indicators to measure achievement of objectives?					
5. Are operational and performance reports processed and analyzed properly?					
6. Are there clear communication channels between upper and lower management levels?					
7. Are budgetary procedures and corporate planning coordinated properly?					
8. Is there continuous and adequate monitoring of ongoing projects?					
9. Are there action plans to remedy shortcomings?					
10. Is management held accountable for its performance?					

Human resources: Manpower planning and incentive measures	*Performance rating scale*				
	Good (Yes)	<<<<	*Medium* (Partly)	>>>>	*Bad* (No)
Qualitative indicators					
1. Is there a system of performance-based incentives in place?					
If yes, is this system in line with the social environment?					
2. Is the remuneration commensurate with that in other sectors of the economy?					
If no, do the fringe benefits (housing, family contributions, etc.) make up for the difference?					
3. Is the utility's training program judged to be adequate?					
The assessment could be based on the following factors: a. Are sufficient resources devoted to training?					
b. Is the time spent on training measures adequate?					
c. Is the training structured?					
d. Are there qualified and motivated trainers?					
e. Are there adequate incentives for staff to participate in training measures?					

Human resources: Manpower planning and incentive measures	*Performance rating scale*					*Target value*
	Good (Yes)	<<<<	*Medium* (Partly)	>>>>	*Bad* (No)	
Quantitative indicators						
1. Turnover of manpower per year as a percentage of average work force						< 10%
2. Rate of absenteeism						
3. Staff vacancies by employee classification (in particular with regard to skilled jobs)						
4. Comparative salary and compensation levels						
5. Share of unskilled workers in the total work force						≤ 30%
6. Training costs by employees and by qualification level						
7. Number of employees per megawatt-hour sold						

Commercial operation and accounting	Performance rating scale					Target value
	Good (Yes)	<<<<	Medium (Partly)	>>>>	Bad (No)	
Qualitative indicators						
1. Overdue accounts:						
a. Are surcharges applied for overdue accounts?						
b. Is there a firm and enforced disconnection policy in place for nonpayment?						
c. Are there extra fees for reconnection?						
Quantitative indicators						
1. Outstanding accounts receivable (in months of billing):						
a. Private customers						≤ 3 months
b. Government and government-owned customers						< 2 months
2. Accounts receivable older than three months of total accounts receivable						≤ 20%
3. Bad debts (unpaid energy) as a percentage of accounts receivable						≤ 10%
4. Billing lag						≤ 30 days
5. Variance between planned budget and actual expenditures						
6. Number of customers per utility employee						
7. Salaries per utility employee						
8. Lags in providing service connection						

Financial performance	*Performance rating scale*					*Target value*
	Good (Yes)	<<<<	*Medium* (Partly)	>>>>	*Bad* (No)	
Quantitative indicators						
1. Rate of return on revalued net fixed assets (after consideration of exchange rate fluctuations)						≥ 8%
2. Average revenues from electricity sales						≥ LRMC
3. Debt service coverage of net revenues						≥ 1.5
4. Cash generation as percentage of investment expenditures (self-funding ratio)						≥ 30%
5. Debt-equity ratio						≤ 2.5

Technical performance and maintenance	Performance rating scale					Target value
	Good (Yes)	<<<<	Medium (Partly)	>>>>	Bad (No)	
Qualitative indicators						
1. Are there appropriate procedures to check the quality of fuel and lubricants?						
2. Is maintenance performed according to set schedules?						
3. Is dispatch performance optimized?						
Quantitative indicators						
1. Reliability of power system:						
a. equivalent forced outage rate						
b. spinning reserve						
2. System unserved energy						≤1%
3. Reserve margin (available capacity/peak demand)						≤1.25
4. Planned outage rate						
5. Time availability of plant per year (hours per year/8760)						≥75%
6. Fuel and lube oil consumption of thermal plants compared to manufacturer's standard						≤110%
7. System fuel cost						

(**Quantitative indicators** *continued on next page*)

Technical performance and maintenance	Performance rating scale					Target value
	Good (Yes)	<<<<	Medium (Partly)	>>>>	Bad (No)	
Quantitative indicators *(continued from previous page)*						
8. System cost of energy delivered						
9. Staff years per MWh generated						
10. System load factor						0.45-0.75
11. System losses (transmission, distribution)						≤20%
12. Technical system losses (if grid configuration allows)						≤15%
13. Station service and own use (kilowatt-hours used per kilowatt-hour generated)						≤5%
14. Nontechnical losses						
15. Thermal (diesel) generation cost in US$ per kilowatt-hour						
16. Lifetime of diesel engines (in hours)						≥75,000

Supply and materials management *(Inventory control, stores control, purchasing, and transportation)*	*Performance rating scale*					*Target value*
	Good (Yes)	<<<<	*Medium* (Partly)	>>>>	*Bad* (No)	
Qualitative indicators 1. Are there appropriate inventory control and order policies?						
2. Is there a reliable fuel supply?						
Quantitative indicators 1. Percentage of inventory scrapped						
2. Percentage of inventory stolen						
3. Procurement procedures: a. Average time from placing of order to receipt of material						
4. Inventory turnover in months						